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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,146	10/24/2003	Kwang-Tsan Chen	MIDWAY-610 (4536*94)	1672

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Connolly Bove Lodge & Hutz LLP
P.O. Box 2207
Wilmington, DE 19899-2207

EXAMINER	
SAYOC, EMMANUEL	

ART UNIT	PAPER NUMBER
3746	

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/693,146	CHEN, KWANG-TSAN	
	Examiner	Art Unit	
	Emmanuel Sayoc	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,9,10 and 12* is/are rejected.

7)☒ Claim(s) *2 and 6-8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The title should refer to at least the principle inventive concept of the claimed invention. "A Miniature Motor Driven Piston Air Compressor with a Valve Mounted on The Piston," is recommended.

Claim Objections

2. Claims 1-12 are objected to because of language technicalities. In claim 1, the applicant introduces a valve in line 13, and a check valve in line 19, where these valves are referred to in the dependent claims. Although it is apparent that the applicant has distinguished the valves from each other, in the dependent claims, by calling one a "valve" and the other a "check valve," technically both valves are check valves. In order to avoid confusion, the applicant is recommended to specifically distinguish the valves using clear language such as "suction check valve" or "discharge check valve." Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Hsiao (U.S. 6,648,612).

In Figures 2, 3, and 5, Hsiao teaches a miniature air compressor comprising a casing (42, 46), a cylinder (68) secured on a top portion of the casing (42, 46), a motor (in 42) mounted in the casing (42, 46) having a shaft (shown not enumerated), a connector (44, 76) secured to a free end of the shaft of the motor, and a crank (34) pivotally connected to the connector (44, 76). A piston (24) is mounted to a free end of the crank (38) and reciprocally movably received in the cylinder (68) for compressing air in the cylinder (68) due to the crank. The piston (24) has an outer periphery air tightly

abutting an inner periphery of the cylinder (68). The piston includes a hole (shown not enumerated) defined in the piston (24) and longitudinally extending through the piston (24). A valve (64) is secured on a top of the piston, the valve (64) having a first end (mid section) secured on the top of the piston (24) and a second end corresponding to the hole in the piston (24) for selectively closing the hole (shown not enumerated) in the piston (24) when the piston is upwardly moved in the cylinder (68). A partition (40) is mounted to the top portion of the casing (42, 46) for air tightly closing the cylinder (68) and forming a chamber (shown not enumerated) in the cylinder (68). A check valve (66) is mounted to the partition (40) and extends to communicate with the cylinder (68) to prevent the compressed air from flowing back into the cylinder (68) when the piston (24) is downward moved. A top cover (32) is air tightly mounted to the partition (40) and has a cavity (shown not enumerated) defined in the top cover (32) for receiving the check valve (66). Thereby the compressed air is decompressed in the cavity when passing through the check valve (66). A joint (62) is mounted to the top cover (32) and extends to communicate with the cavity in the top cover (32). The joint extends outward for connection to a user or storage device, and is therefore adapted to be connected to a spray tool, or any other fluid apparatus.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claim 3, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsiao (U.S. 6,648,612 B2), as applied to claim 1, and in further view of Muller, Jr. (U.S. 4,161,189).

Hsiao sets forth a device as described above, which is substantially analogous to the claimed invention. The Hsiao device differs from the claimed invention in that there is no explicit teaching of the check valve comprising multiple through holes defined in an outer periphery of the check valve and extending to an inner periphery of the check valve, and a slider reciprocally movably received in the check valve for selectively closing the multiple through holes when the piston is downward moved. Muller, Jr. in Figures 1-3 teaches a control valve, which is usable as a discharge check valve in any pressure regulating application such as in pumping. The check valve (Figure 2 and 3)

comprises multiple through holes (16) defined in an outer periphery of the check valve (Figure 2 and 3) and extending to an inner periphery of the check valve (Figure 2 and 3), and a slider (13) reciprocally movably received in the check valve (Figure 2 and 3, valve housing 12) for selectively closing the multiple through holes (16). The valve features a high degree of response and improved stability (column 1 lines 39-41). Therefore it would have been obvious to one of ordinary skill in the art at time the invention was made to modify the Hsiao device by, incorporating the pressure valve, as taught by Mueller, Jr., in order to advantageously achieve high degree of response and improved stability in the discharge valve. Since the pressure in the pumping chamber of Hsiao acts upon the discharge valve, in the combination, the slider electively closes the multiple through holes when the piston is downward moved in a suction stroke.

The Hsiao, as modified by Muller, Jr. device differs from the claimed invention in that there is no explicit teaching of a washer being used to prevent upward movement of the valve. As seen in Figure 5, the valve (64) is bolted into the face of the piston (24) with bolt (56). The examiner takes official notice that the use of washers was well known in the art at the time the invention was made to enhance bolt locking connections.

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsiao, as applied to claim 1.

Hsiao sets forth a device as described above, which is substantially analogous to the claimed invention. The Hsiao device differs from the claimed invention in that there is no explicit teaching of a washer being used to prevent upward movement of the valve. As seen in Figure 5, the valve (64) is bolted into the face of the piston (24) with bolt (56). The examiner takes official notice that the use of washers was well known in the art at the time the invention was made to enhance bolt locking connections.

10. Claim 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsiao (U.S. 6,648,612 B2), as applied to claims 1, and 4, and in further view of Graber et al. (U.S. 6,530,760 B1).

Hsiao sets forth a device as described above, which is substantially analogous to the claimed invention. The Hsiao device differs from the claimed invention in that there is no explicit teaching of the partition comprising a ring of protrusion downward extending therefrom, where the ring of protrusion has an inner diameter slightly greater than an outer diameter of the cylinder such that the cylinder is longitudinally air tightly mounted to the partition within the ring of protrusion. Graber et al., in Figure 1, teach an analogous piston compressor (1) with a piston (100), a cylinder (30), and a partition (202). It is evident that the cylinder (30) is inserted into the partition (202) via ring shaped protrusions (shown not enumerated) where the protrusion has an inner diameter slightly greater than an outer diameter of the cylinder (30) such that the cylinder (30) is longitudinally air tightly mounted to the partition (202) within the ring of protrusion. This

allows for an enhanced seal between the cylinder and the protrusion, and the protrusion also allows for a guide during assembly to ensure proper fitment of the cylinder and the partition. Therefore it would have been obvious to one of ordinary skill in the art at time the invention was made to modify the Hsiao device by, incorporating the ring shaped protrusion of the partition and the connection to the cylinder, as taught by Graber et al., in order to advantageously allow for an enhanced seal between the cylinder and the protrusion, and a guide during assembly to ensure proper fitment of the cylinder and the partition.

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsiao, as modified by Muller, Jr., as applied to claim 3, and in further view of Graber et al.

Hsiao, as modified by Muller, Jr., set forth a device as described above, which is substantially analogous to the claimed invention. The Hsiao, as modified by Muller, Jr., device differs from the claimed invention in that there is no explicit teaching of the partition comprising a ring of protrusion downward extending therefrom, where the ring of protrusion has an inner diameter slightly greater than an outer diameter of the cylinder such that the cylinder is longitudinally air tightly mounted to the partition within the ring of protrusion. Graber et al., in Figure 1, teach an analogous piston compressor (1) with a piston (100), a cylinder (30), and a partition (202). It is evident that the cylinder (30) is inserted into the partition (202) via ring shaped protrusions (shown not enumerated) where the protrusion has an inner diameter slightly greater than an outer

diameter of the cylinder (30) such that the cylinder (30) is longitudinally air tightly mounted to the partition (202) within the ring of protrusion. This allows for an enhanced seal between the cylinder and the protrusion, and the protrusion also allows for a guide during assembly to ensure proper fitment of the cylinder and the partition. Therefore it would have been obvious to one of ordinary skill in the art at time the invention was made to further modify the Hsiao, as modified by Muller, Jr., device by, incorporating the ring shaped protrusion of the partition and the connection to the cylinder, as taught by Graber et al., in order to advantageously allow for an enhanced seal between the cylinder and the protrusion, and a guide during assembly to ensure proper fitment of the cylinder and the partition.

Allowable Subject Matter

12. Claims 2, 6-8, 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited to further show the state of the art with respect to piston compressors.

U.S. Pat. 5,170,818 to Hatzikazakis, 4,171,712 to DeForrest, and 1,196,926 to Brown – teach similar check valves to that of the claimed invention.

U.S. Pat. 6,193,475 to Rozek, 2,163,391 to Aikman, and 2,156,943 to Heller – teach piston compressors similar to the claimed invention.

Contact Information

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Sayoc whose telephone number is (571) 272 4832. The examiner can normally be reached on M-F 8-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy S. Thorpe can be reached on (571) 272-4444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Emmanuel Sayoc
Examiner
Art Unit 3746

ECS